AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (Currently Amended) For a digital television packet stream having a plurality of different types of tables, a method to optimize a bandwidth usage of a data stream and to determine issuance intervals for a plurality of event information tables (EITs) and a plurality of extended text tables (ETTs) that are inserted in the data stream, wherein the EITs are assigned to cover different ranges of broadcasting time, and an issuance interval for an EIT is a period at which the corresponding EIT is issued, the method comprising:

setting the issuance intervals for the EITs, respectively, to be non-uniform based on the range of broadcasting time which each of the EITs is assigned to cover,

wherein among the EITs, the issuance interval for an EIT covering a range of broadcasting time nearer a current time is set to be less than the issuance interval for an EIT covering a range of broadcasting time further in the future;

setting a uniform issuance interval for ETTs to be transmitted in sequence, wherein the ETTs contain program description information associated with the EITs, respectively;

inserting the EITs at the non-uniform issuance intervals, respectively, into the data stream; and

inserting the ETTs at the uniform issuance interval, respectively, into the data ~~stream~~stream, wherein the uniform issuance interval set for the ETTs is greater than an issuance interval set for an EIT nearest to the current time.

2.   (Canceled)

3.   (Canceled)

    4.   (Currently Amended) For a digital television packet stream having a plurality of different types of tables, a method to optimize a bandwidth usage of a data stream and to determine issuance intervals for a plurality of event information tables (EITs) and a plurality of extended text tables (ETTs) that are inserted into the data stream, the method comprising:

    setting the issuance intervals for the EITs, respectively, to be non-uniform, wherein an issuance interval between any two adjacent instances of an ith EIT is determined according to the following equation:

$$\text{interval } (i^{th} \text{ EIT}) = \text{root\_time} + (\text{increment\_time})*i,$$

    wherein interval(i^{th} EIT) is the interval between any two adjacent instances of the ith EIT, root_time is a predetermined interval for the EIT corresponding most closely in time to the present, increment_time is a non-zero scalar and i is ~~a non-zero~~an integer greater than one;

    setting a uniform issuance interval for the plurality of ETTs to be transmitted in sequence, wherein the ETTs contain program description information associated with the EITs, respectively;

    inserting the EITs at the non-uniform issuance intervals, respectively, into the data stream; and

    inserting the ETTs at the uniform issuance interval, respectively, into the data stream.

    5.   (Canceled)

    6.   (Currently Amended) A program and system information protocol (PSIP) generator to optimize a bandwidth of a digital system packet stream and to insert a plurality of event information tables (EITs) and a plurality of extended text tables (ETTs) into the digital system packet stream, the generator comprising:

an interface to supply issuance-interval setting information required for setting

issuance intervals respectively for the plurality of EITs to be transmitted in sequence,

wherein an issuance interval for an EIT is a period at which the corresponding EIT is

issued, and the issuance-interval setting information is an assignment of each of the EITs

to cover one of different ranges of broadcasting time;

an interval determination unit to determine non-uniform issuance intervals

respectively for the EITs, based upon the issuance-interval setting information, and to

determine a uniform issuance interval for the plurality of ETTs to be transmitted in

sequence, the ETTs containing program description information associated with the EITs,

respectively,

wherein among the EITs, the issuance interval for an EIT covering a range of

broadcasting time nearer a current time is set to be less than the issuance interval for an

EIT covering a range of broadcasting time further in the future; and

wherein the generator inserts the EITs at the non-uniform issuance intervals and

the ETTs at the uniform issuance interval determined by the interval determination unit

into the digital system packet ~~stream~~stream, wherein the uniform issuance interval set for

the ETTs is greater than an issuance interval set for an EIT nearest to the current time.

7.   (Canceled)

8.   (Canceled)

9.   (Currently Amended) A program and system information protocol (PSIP)

generator to ~~optimze~~optimize a bandwidth for a digital television system packet stream

and to insert a plurality of event information tables (EITs) and a plurality of extended text

tables (ETTs) into the digital system packet stream, the generator comprising:

an interface to supply issuance-setting information required for setting issuance

intervals for the plurality of EITs to be transmitted in sequence;

an interval determination unit to determine non-uniform issuance intervals

respectively for the EITs based upon the issuance-setting information, and to determine a

uniform issuance interval for the plurality of ETTs to be transmitted in sequence, the

ETTs containing program description information associated with the EITs, respectively,

wherein among the EITs, an issuance interval between any two adjacent instances of an ith EIT is determined according to the following equation:

$$interval(i^{th}\ EIT) = root\_time + (increment\_time)*i,$$

wherein interval(ith EIT) is the interval between any two adjacent instances of the ith EIT table, root_time is a predetermined interval for the EIT corresponding most closely in time to the present, increment_time, increment_time is a non-zero scalar and i is a~non-zero~an integer greater than one; and

wherein the generator inserts the EITs at the non-uniform issuance intervals and the ETTs at the uniform issuance interval determined by the interval determination unit into the digital system packet stream.

10.   (Canceled)

11.   (Original) The PSIP generator of claim 6, wherein said PSIP generator is embodied in the form of a processor running software.

12.   (Previously Presented) The PSIP generator of claim 11, wherein said software is written in the computer language Java.

13.   (Previously Presented) A processor-readable article of manufacture having embodied thereon software comprising a plurality of code segments to perform the method of claim 1.

14.   (Original) A processor-readable article of manufacture having embodied thereon software comprising a plurality of code segments to cause a processor to perform the functional aspects of the program and system information protocol (PSIP) generator of claim 6.

15.   (Currently Amended) The method of claim 1, wherein the EITs include EIT-0, EIT-1, and ~EIT-2~EIT-2, wherein the EIT nearest to the current time is EIT-0.

16.   (Previously Presented) The method of claim 15, wherein in the setting step, the issuance intervals are set respectively for EIT-0, EIT-1, and EIT-2 to increase as the EIT table number increases.

17.   (Currently Amended) The PSIP generator of claim 6, wherein the EITs include EIT-0, EIT-1, and ~~EIT-2~~EIT-2, wherein the EIT nearest to the current time is EIT-0.

18.   (Previously Presented) The PSIP generator of claim 17, wherein the non-uniform interval determination unit determines to increase the issuance intervals respectively for EIT-0, EIT-1, EIT-2 as the EIT table number increases.

19.   (Currently Amended) A method of optimizing a bandwidth of a data stream and determining transmission cycles of a group of event information tables (EITs) including at least EIT-0, EIT-1, and EIT-2, and transmission cycles of a group of extended text tables (ETTs) that are inserted into the data stream, the method comprising:

setting the transmission cycles of the group of EITs to be non-uniform with respect to each other, based on closeness in coverage time to which each EIT in the group of EITs is assigned, to a current broadcasting time,

wherein among the group of EITs, the transmission cycle of an EIT assigned to a coverage time nearer the current time is set to be less than the transmission cycle of an EIT assigned to a coverage time further in the future from the current broadcasting time;

setting a uniform transmission cycle of the group of extended text tables (ETTs) including at least ETT-0, ETT-1, and ETT-2, wherein the ETTs contain program description information associated with the EITs, respectively;

inserting the EIT-0, EIT-1, and EIT-2 at the non-uniform transmission cycles into the data stream; and

inserting the ETT-0, ~~ETT-1~~ETT-1, and ETT-2 at the uniform transmission cycles into the data ~~stream~~stream, wherein the uniform transmission cycle set for ETT-0, ETT-1, and ETT-2 is greater than the transmission cycle set for the EIT-0.

20.   (Previously Presented) The method of claim 19, wherein in the setting step, the transmission cycles are set respectively for EIT-0, EIT-1, and EIT-2 in the group of EITs to increase as the EIT table number increases.

21.   (Currently Amended) A method of optimizing a bandwidth of a data stream and determining transmission cycles of a group of different event information tables (EITs) including at least EIT-0, EIT-1, and EIT-2, and transmission cycles of a group of different extended text tables (ETTs) including at least ETT-0, ~~ETT-1~~ETT-1, and ETT-2 that are inserted into the data stream, the method comprising:

    systematically incrementing the transmission cycles of the group of EITs to be non-uniform with respect to each other, based on closeness in coverage time to which each EIT in the group of EITs pertains, to a currently broadcasting time,

    wherein among the group of EITs, the transmission cycle of an EIT pertaining to a coverage time nearer the current broadcasting time is set to be less than the transmission cycle of an EIT pertaining to a coverage time further in the future from the currently broadcasting time;

    setting a uniform transmission cycle for the group of different ETTs including at least ETT-0, ~~ETT-1~~ETT-1, and ETT-2, wherein ETTs contain program description information associated with the EITs, respectively;

    inserting the group of different EITs including at least EIT-0, EIT-1, and EIT-2 at the systematically incremented transmission cycles into the data stream; and

    inserting the group of different ETTs including at least ETT-0, ETT-1, and ETT-2 at the transmission cycle that is uniform into the data ~~stream~~stream, wherein the uniform transmission cycle set for ETT-0, ETT-1, and ETT-2 is greater than the transmission cycle set for the EIT-0.

22.   (Currently Amended) A method of optimizing bandwidth of a digital television packet stream and determining issuance intervals for tables to be included in the digital television packet stream, the method comprising:

    setting issuance intervals for a plurality of event information tables (EIT$_0$, EIT$_1$, and EIT$_2$) and a plurality of extended text tables (ETT$_0$, ETT$_1$, and ETT$_2$) to be transmitted in sequence according to the following conditions:

issuance interval (EIT_{i-1}) < issuance interval (EIT_i) for i=1 and 2, and

issuance interval ($\sout{EIT_{i-1}}ETT_{i-1}$) = issuance interval ($\sout{EIT_i}ETT_i$) for i=1 and 2,

wherein an issuance interval for an EIT is a period at which the corresponding EIT is issued within a packet stream, and range of broadcasting time covered by EIT_{i-1} is prior to a range of broadcasting time covered by EIT_i, and

wherein the ETTs contain program description information associated with the EITs;

inserting the plurality of EITs (EIT_0, EIT_1, and EIT_2) at the issuance intervals of the plurality of EITs into the digital television packet stream; and

inserting the plurality of ETTs (ETT_0, ETT_1, and ETT_2) at the issuance intervals of the plurality of ETTs into the digital television packet ~~stream~~stream, wherein the issuance intervals set for ETT_0, ETT_1, and ETT_2 are greater than the issuance interval set for EIT_0.

23.   (Currently Amended) A program and system information protocol (PSIP) generator to optimize a bandwidth of a digital television system packet stream and to generate tables for a digital television system packet stream, the generator comprising:

an issuance interval determination unit to set issuance intervals for a plurality of event information tables (EIT_0, EIT_1, and EIT_2) and a plurality of extended text tables (ETT_0, ETT_1, and ETT_2) to be transmitted in sequence according to the following conditions:

issuance interval (EIT_{i-1}) < issuance interval (EIT_i) for i=1 and 2, and

issuance interval (ETT_{i-1}) = issuance interval (ETT_i) for i=1 and 2,

wherein an issuance interval for an EIT is a period at which the corresponding EIT is issued within a packet stream, and a range of broadcasting time covered by EIT_{i-1} is prior to a range of broadcasting time covered by EIT_i, and

wherein the ETTs contain program description information associated with the EITs; and

8

U.S. Application No. 09/828,865   Attorney Docket No.: 8736.134.00
Amdt. dated May 14, 2007
Reply to Office Action dated March 13, 2007

inserting the plurality of EITs (EIT_0, EIT_1, and EIT_2) at the issuance intervals of the plurality of EITs into the digital television system packet stream; and

inserting the plurality of ETTs (ETT_0, ETT_1, and ETT_2) at the issuance intervals of the plurality of ETTs into the digital television system packet ~~stream~~stream, wherein the issuance intervals set for ETT_0, ETT_1, and ETT_2 are greater than the issuance interval set for EIT_0.

24.   (Currently Amended) A method of optimizing a bandwidth of a digital television packet stream and determining transmission cycles for tables to be transmitted as part of a digital television packet stream, the method comprising:

setting transmission cycles for a plurality of event information tables (EIT_0, EIT_1, and EIT_2) and a plurality of extended text tables (ETT_0, ETT_1, and ETT_2) to be transmitted in sequence according to the following conditions:

transmission cycle (EIT_{i-1}) < transmission cycle (EIT_i) for i=1 and 2, and

~~issuance interval~~transmission cycle (ETT_{i-1}) = ~~issuance interval~~transmission cycle (ETT_i) for i=1 and 2,

wherein a transmission cycle for an EIT is a period at which the corresponding EIT is transmitted, and a range of broadcasting time covered by EIT_{i-1} is prior to a range of broadcasting time covered by EIT_i, and

wherein the ETTs contain program description information associated with the EITs;

inserting the plurality of EITs (EIT_0, EIT_1, and EIT_2) at the transmission cycles of the plurality of EITs into the digital television packet stream; and

inserting the plurality of ETTs (ETT_0, ETT_1, and ETT_2) at the issuance intervals of the plurality of ETTs into the digital television packet ~~stream~~stream, wherein the transmission cycles set for ETT_0, ETT_1, and ETT_2 are greater than the transmission cycle set for EIT_0.

25.   (Currently Amended) A program and system information protocol (PSIP)

generator to optimize a bandwidth of a digital television packet stream and to generate

tables to be transmitted as part of a digital television packet stream, the generator

comprising:

a transmission cycle determination unit to set transmission cycles for a plurality of

event information tables(EIT_0, EIT_1, and EIT_2) and a plurality of extended text tables

(ETT_0, ETT_1, and ETT_2) to be transmitted in sequence according to the following

conditions:

transmission cycle (EIT_{i-1}) < transmission cycle (EIT_i) for i=1 and 2, and

~~issuance interval~~transmission cycle (ETT_{i-1}) = ~~issuance interval~~transmission cycle

(ETT_i) for i=1 and 2,

wherein a transmission cycle for an EIT is a period at which the corresponding

EIT is transmitted, and a range of broadcasting time covered by EIT_{i-1} is prior to a range

of broadcasting time covered by EIT_i, and

wherein the ETTs contain program description information associated with the

EITs;

wherein the generator inserts the plurality of EITs (EIT_0, EIT_1, and EIT_2) at the

transmission cycles of the plurality of EITs into the digital television packet stream; and

the generator inserts the plurality of ETTs (ETT_0, ETT_1, and ETT_2) at the issuance

intervals of the plurality of ETTs into the digital television packet ~~stream~~stream, wherein

the transmission cycles set for ETT_0, ETT_1, and ETT_2 are greater than the transmission

cycle set for EIT_0.

26.   (Currently Amended) ~~Instructions encoded on at~~At least one computer-readable

medium encoded with computer readable instructions for use in a digital broadcast

receiver, which when executed by a processor causes the processor to at least generate:

a digital television (DTV) packet stream including a plurality of event

information tables (EITs) to be transmitted in sequence, the EITs being assigned to cover

different ranges of broadcasting time,

wherein the EITs are issued periodically within the packet stream at non-uniform periods, respectively, such that an issuance period for an EIT covering a range of broadcast time nearer a current time is set to be less than an issuance period for an EIT covering a range of broadcasting time further in the future, and

wherein the processor further generates at least a plurality of extended text tables (ETTs) to be transmitted in sequence, the ETTs containing program description information associated with the ETTs and being issued periodically within the packet stream at a uniform period,

the processor further inserting the EITs at the non-uniform periods into the DTV packet stream; and

the processor further inserting the ETTs at the uniform period into the DTV packet streamstream, wherein the uniform period set for the ETTs is greater than the issuance period set for an EIT nearest to the current time.

27.   (Currently Amended) Instructions encoded on atAt least one computer-readable medium encoded with computer readable instructions for useduse in a digital broadcast receiver, which when executed by a processor causes the processor to at least generate:

a digital television (DTV) packet stream including a plurality of event information tables(EIT_0, EIT_1, and EIT_2) and a plurality of extended text tables (ETT_0, ETT_1, and ETT_2) to be transmitted, which are periodically repeated within the packet stream according to the following conditions:

transmission cycle (EIT_{i-1}) < transmission cycle (EIT_i) for i=1 and 2, and

transmission cycle (ETT_{i-1}) = transmission cycle (ETT_i) for i=1 and 2,

wherein a transmission cycle for an EIT is a frequency at which the corresponding EIT is transmitted, and a range of broadcasting time covered by EIT_{i-1} is prior to a range of broadcasting time covered by EIT_i, and

wherein the ETTS contain program description information associated with the EITs,

wherein the processor inserts the plurality of EITs (EIT_0, EIT_1, and EIT_2) at the transmission cycles of the EITs into the DTV packet stream, and

the processor inserts the plurality of ETTs (ETT_0, ETT_1, and ETT_2) at the

transmission cycle of the ETTs into the DTV packet ~~stream~~stream, wherein the

transmission cycles set for ETT_0, ETT_1, and ETT_2 are greater than the transmission cycle

set for EIT_0.